

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
28 April 2005 (28.04.2005)

PCT

(10) International Publication Number  
**WO 2005/037786 A1**

(51) International Patent Classification<sup>7</sup>: **C07D 207/337**,  
231/12, 241/12, 307/46, 213/55, 213/56, 401/04, A61K  
31/341, 31/402, 31/415, 31/4418, 31/4439, 31/4965, A61P  
13/00

(74) Agent: **RUTTER, Keith**; GlaxoSmithKline, Corporate  
Intellectual Property (CN925.1), 980 Great West Road,  
Brentford Middlesex TW8 9GS (GB).

(21) International Application Number:  
PCT/EP2004/011366

(22) International Filing Date: 6 October 2004 (06.10.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
0323585.0 8 October 2003 (08.10.2003) GB

(71) Applicant (for all designated States except US): **GLAXO  
GROUP LIMITED** [GB/GB]; Glaxo Wellcome House,  
Berkeley Avenue, Greenford Middlesex UB6 0NN (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GIBLIN, Gerard,  
Martin, Paul** [GB/GB]; GlaxoSmithKline, New Frontiers  
Science Park South, Third Avenue, Harlow Essex CM19  
5AW (GB). **HALL, Adrian** [GB/GB]; GlaxoSmithKline,  
New Frontiers Science Park South, Third Avenue, Har-  
low Essex CM19 5AW (GB). **KILFORD, Ian, Reginald**  
[GB/GB]; GlaxoSmithKline, New Frontiers Science Park  
South, Third Avenue, Harlow Essex CM19 5AW (GB).  
**LEWELL, Xiao, Qing** [GB/GB]; GlaxoSmithKline, Gun-  
nels Wood Road, Stevenage Hertfordshire SG1 2NY (GB).  
**MILLER, Neil, Derek** [GB/GB]; GlaxoSmithKline, New  
Frontiers Science Park South, Third Avenue, Harlow Es-  
sex CM19 5AW (GB). **NAYLOR, Alan** [GB/GB]; Glaxo-  
SmithKline, New Frontiers Science Park South, Third Av-  
enue, Harlow Essex CM19 5AW (GB).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM,  
TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,  
ZW.

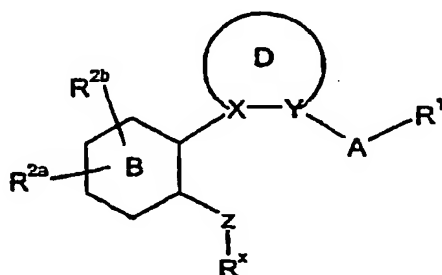
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SI, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: HETEROCYCLYL COMPOUNDS



(I)

(57) Abstract: Compounds of formula (I) or a pharmaceutically ac-  
ceptable derivative thereof: wherein A, B, D, Z, R<sup>1</sup>, R<sup>2a</sup>, R<sup>2b</sup>, and R<sup>x</sup>  
are as defined in the specification, a process for the preparation of such  
compounds, pharmaceutical compositions comprising such compounds  
and the use of such compounds in treating conditions mediated by the  
action of PGI<sub>2</sub> at EP<sub>1</sub> receptors. Such conditions include pain, or in-  
flammatory, immunological, bone, neurodegenerative or renal disor-  
ders.